USER'S MANUAL

NexGen™

Nx586® PCI/ISA System Board
with on board Bus Master PCI IDE and Super I/O

October 2, 1995

Designed for Microsoft® Windows® 95

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WARNING

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Introduction

Congratulations! You have purchased a NexGen Nx586 system board, part of the family of high-performance personal computer products from NexGen. This motherboard has been designed to fit in most standard AT and baby-AT enclosures. To avoid damage to your system please read the installation section thoroughly before attempting to install the motherboard or configure your system.

This chapter describes the many features of the Nx586 PCI/ISA system board. This chapter also provides an overview of this manual to help you locate information quickly.

Features

The NexGen Nx586 system board includes the following features:

- Supports NexGen Nx586 processors with 32KB level 1 cache.
- NexGen NxPCI/NxMC chipset.
- High performance 256KB write-back secondary cache.
- Supports up to 192MB of main memory on-board using 72-pin SIMM DRAM, Fast Page Mode memory modules.
- Three 32-bit PCI 2.0 compatible local bus expansion slots with bus mastering capability, four 16-bit ISA Expansion slots, with one shared slot position.
- AMI WINBIOS® with "Plug and Play" support.
- On-board Super I/O with 2 serial ports, 1 parallel port, and floppy controller.
- On-board Dual Channel Bus Mastering PCI IDE controller.
- Flash BIOS support for easy upgrading.
- 3-year limited warranty.

About This Manual

This manual is organized as follows:

- The Hardware Setup section describes how to install and set up the Nx586 system board, memory, and peripherals. Included in this section are the motherboard layout and DRAM memory table.
- The Software Configuration section describes the WINBIOS setup.
- The Technical Reference section describes the jumper and switch settings for the Nx586 system board.

Checklist

The following items are included with your Nx586 system board package:

- Nx586 system board
- This manual
- 2 serial, 1 parallel, 1 IDE and 1 floppy drive cable(s)
- Diskette with device drivers for the on-board IDE controller

If you suspect that any of the items in the system unit package have been damaged or that items are missing, contact your reseller immediately.

Hardware Setup

Overview

This section provides instructions for installing and setting up your Nx586 system board, installing memory modules and PCI/ISA-BUS peripherals. It also contains a diagram of the system board (see Figure 1 System board Layout, next page) for reference purposes. To run the WINBIOS setup see the Software Configuration Section for the AMI WINBIOS.

CAUTION!

The procedures described are meant as general guidelines for the experienced installer. Contact your dealer if you are unsure about the installation, or if you need more detailed information about any portion of the installation process.

System Board Layout

Familiarize yourself with the components of the Nx586 system board.

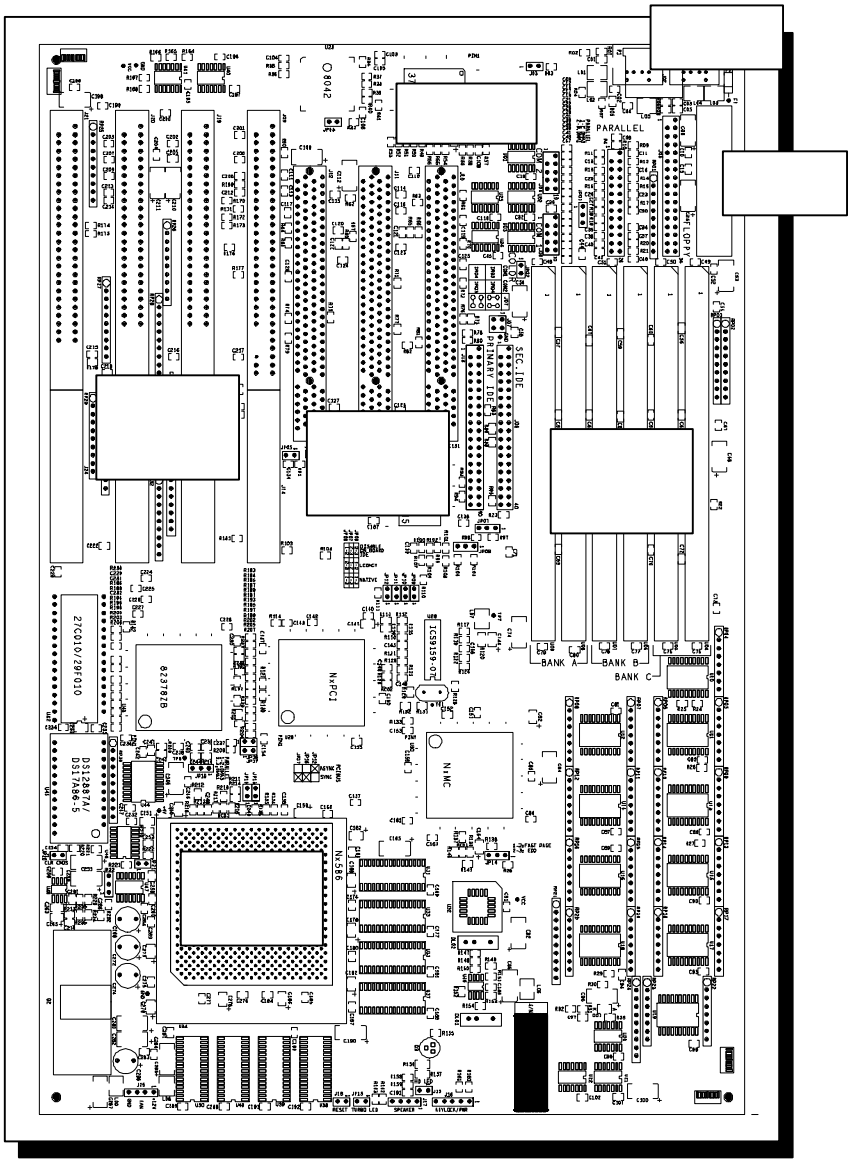


Figure 1. System Board Layout

Hardware Installation Step by Step

The installation of your Nx586 system board consists of6 basic steps (your installation may vary depending on your system configuration):

Step 1. Configure the system board.

Step 2. Install the system board into your computer chassis.

Step 3. Install the DRAM modules.

Step 4. Install any internal PCI/ISA peripherals.

Step 5. Connect the monitor, keyboard, and other external peripherals.

Step 6. Run the WINBIOS Setup program to configure your system board's memory, hard drive and floppy drive parameters

Step 1. Configuring the System Board

The Nx586 system board options are configured through both software/WINBIOS and hardware jumpers. The software/WINBIOS configuration settings are discussed in the Software Configuration section of this manual and the Technical Reference section of this manuallists all of the jumper settings for the Nx586 system board. We do not recommend changing ANY jumper settings unless the user is an experienced installer -- misuse of jumper settings can result in system board failure and/or loss of warranty. The factory default configuration for the onboard peripherals is:

Onboard serial ports:	Enabled as COM1 and COM2
Onboard parallel port:	Enabled as LPT1
Onboard floppy controller:	Enabled
Onboard IDE controller:	Enabled

Please refer to the appropriate section of this manual if you need to change any of these settings.

Step 2. Installing the System Board

CAUTION!
Make sure to observe precautions for handling static sensitive devices. Static electricity can harm components on your Nx586 system board and cause system failure.

The Nx586 system board is designed to fit into most standard AT/Baby AT enclosures.Follow the instructions for your particular chassis in order toinstall the Nx586 system board. Make sure your chassis power supply can generate adequate power for your system board and peripherals. For safety purposes, NexGen recommends using only chassis' that employ UL, CSA or TUV certified power supplies.

WARNING:
The Nx586 processor requires adequate air flow to dissipate the heat generated by the processor. Make sure that the processor fan is not obstructed and is operational. If the fan is not working, return the board to your dealer for an exchange.

Step 3. Installing DRAM Modules

The Nx586 system board accommodates six72-pin, 32-bit or 36-bit DRAM SIMM modules. When installing memory, the DRAM speed for P90 and P100 systems must be 70ns or faster, and must support fast-page mode. The six SIMM slots are labeled in pairs as Bank A, Bank B and Bank C. The banks may be populated in any order, (Bank C then Bank A then Bank B etc..) but both SIMMs within a bank must be installed at the same time with the same density (1M, 2M, 4M ...) of DRAM module. Any of the following single density SIMMs, (1M, 4M or 16M) or double density (2M, 8M or 32M) SIMM modules may be used. Table 1-1 shows a short list of the possible memory configurations.

DRAM Configurations

Bank A		Bank B		Bank C		
SIMM 1 of 2	SIMM 2 of 2	SIMM 1 of 2	SIMM 2 of 2	SIMM 1 of 2	SIMM 2 of 2	TOTAL
1MB x 32	1MB x 32					8 MB
2MB x 32	2MB x 32					16 MB
4MB x 32	4MB x 32					32 MB
8MB x 32	8MB x 32					64 MB
2MB x 32	2MB x 32	1MB x 32	1MB x 32			24 MB
2MB x 32	2MB x 32	2MB x 32	2MB x 32			32 MB
2MB x 32	2MB x 32	4MB x 32	4MB x 32			48 MB
2MB x 32	2MB x 32	8MB x 32	8MB x 32			80 MB
...	...	...	...	...	...	...
4MB x 32	4MB x 32	2MB x 32	2MB x 32	1MB x 32	1MB x 32	56 MB
4MB x 32	4MB x 32	2MB x 32	2MB x 32	2MB x 32	2MB x 32	64 MB
4MB x 32	4MB x 32	2MB x 32	2MB x 32	4MB x 32	4MB x 32	80 MB
4MB x 32	4MB x 32	2MB x 32	2MB x 32	8MB x 32	8MB x 32	112 MB
...	...	...	...	...	...	...
8MB x 32	8MB x 32	4MB x 32	4MB x 32	1MB x 32	1MB x 32	104 MB
8MB x 32	8MB x 32	4MB x 32	4MB x 32	2MB x 32	2MB x 32	112 MB
8MB x 32	8MB x 32	4MB x 32	4MB x 32	4MB x 32	4MB x 32	128 MB
8MB x 32	8MB x 32	4MB x 32	4MB x 32	8MB x 32	8MB x 32	160 MB
8MB x 32	8MB x 32	8MB x 32	8MB x 32	1MB x 32	1MB x 32	136 MB
8MB x 32	8MB x 32	8MB x 32	8MB x 32	2MB x 32	2MB x 32	144 MB
8MB x 32	8MB x 32	8MB x 32	8MB x 32	4MB x 32	4MB x 32	160 MB
8MB x 32	8MB x 32	8MB x 32	8MB x 32	8MB x 32	8MB x 32	192 MB

Table 1. Partial DRAM Configuration List

Step 4. PCI/ISA Bus Adapter Installation Procedure

To install a PCI or ISA-Bus adapter card:

1. Locate a free PCI or ISA Bus slot on the system board, either a PCI or ISA slot whichever is appropriate for the card to be installed.
2. Remove the appropriate expansion slot cover plate from the chassis.
3. Line up the adapter along the slotto be used and insert the gold-edged connectors into the connector on the motherboard completely. Make sure that the adapter is well seated in the slot. Secure the adapter to the chassis with a slot cover screw.
4. The system should automatically recognize the added adapter. If you have added a video adapter and wish to use the extended video modes, you may have to install additional drivers corresponding to the programs and environments used.

Step 5. Connecting External Peripherals

Connect your monitor, keyboard, mouse, AC power cord, and other external devices to your chassis before powering on the system.

Step 6. Running WINBIOS Setup

Once the motherboard has been mounted in the case and all of the peripherals connected, the final step is to run the WINBIOS setup program. When the system is turned on for the first time, the WINBIOS will notice the addition of DRAM memory and other peripherals and prompt you to enter the setup utility. The next section of this manual describes the use of the AMI WINBIOS Setup utility in configuring your system. After running Setup, you can proceed with installation of system and application software.

Software Configuration of System Board Components

AMI WINBIOS Setup

Introduction

The WINBIOS setup is a program in the Flash ROM (permanent memory) of your system board that configures the DRAM, date and time, the type and number of hard disks connected, and virtually all of the main system level components. The WINBIOS Setup values may have already been set prior to shipment.

A record of the system parameters (such as amount of memory, types of disk drives, video display, numeric coprocessor, and other peripherals) is stored in a special area of memory called CMOS RAM. When the computer is turned off, a backup battery provides power to the CMOS RAM, thereby retaining your system configuration. The backup battery contained on this motherboard is rated for a 10 year average life.

Each time the system is turned on it is configured with the values stored in the CMOS RAM, unless the CMOS RAM was corrupted. If for some reason, the CMOS RAM is corrupted, the system is configured with the default values stored in the Flash ROM. There are two sets of WINBIOS values stored in the Flash ROM: the WINBIOS Setup default values and the Power-On default values

Note: Your system may have been pre-configured prior to shipment. It is only necessary to execute the configuration program if:

* You have changed the hardware configuration (i.e.: added memory, added or removed drives, etc.).

* The system itself has detected an error while booting up and requires you to reconfigure CMOS RAM

Users are not encouraged to run this setup program unless they are familiar with it. Improper use of this setup program can result in system failure.

Running the WINBIOS Setup

When the system power is turned on, the computer performs a series of device initializations and diagnostic tests. During this process, the system will allow you to interrupt the process and run Setup by pressing the <Del> key. When the Power-On-Self-Test (POST) has completed, the following message appears:

Press the <Del> key to enter the Setup program.

Once inside the Setup program, either a mouse or the keyboard can be used to maneuver and modify the setup parameters. The table below describes special keys used to perform certain functions within the Setup program.

Keystroke	Action
TAB	Move to the next window or field.
®, ¬, ¯, ▯	Moves cursor from one option to the next within a window or menu.
<ENTER>	Select item highlighted.
+	Increments a value
-	Decrements a value
<Esc>	Returns to previous screen or menu, also used to exit setup.
<PgUp>	Returns to the previous page
<PgDn>	Advances to the next page
<Home>	Returns to the beginning of the text
<End>	Advances to the end of the text
<Alt>+<H>	Displays Help screen
<Alt>+<SPACE>	Global Exit Setup from any menu

Table 2. Keyboard Use Within Setup

The WINBIOS will also recognize most PS/2, serial and in-port style mice. The mouse click functions are:

- single click to change or select items
- double click to perform an operation in the current field
- click on the “close box” in the upper left corner of a window to close the window or exit from Setup

Exiting the Setup Program

When finished making changes within Setup press the <Esc> key until the following menu shown in figure 2 appears. At this point, you are presented with the three choices described below.

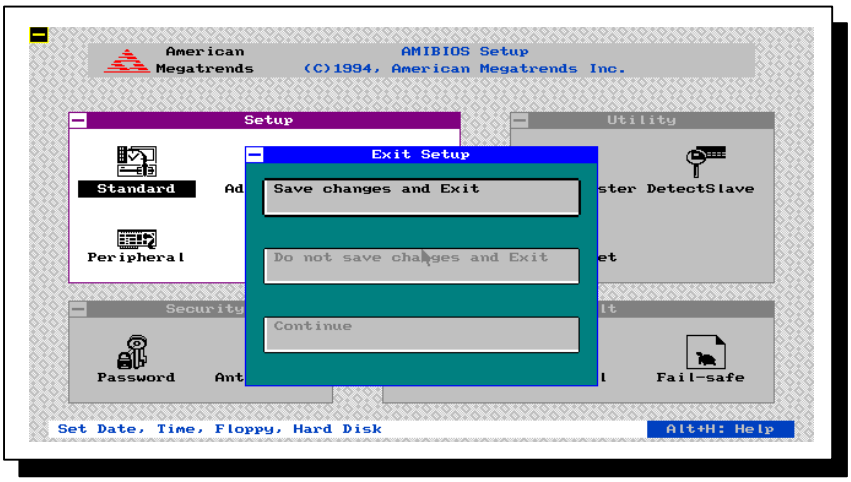


Figure 2. Exit Setup Menu

Save Changes and Exit
This option is used to save the changes made during this session in the Setup program then continue the boot process. After pressing <Enter> with this option highlighted all settings that were modified are stored in CMOS RAM then a CMOS RAM checksum is calculated and written to CMOS RAM. Control is then passed to the ROM WINBIOS and the WINBIOS either reboots the system, (if any new setting changed the memory map) or continues the booting process.

Do Not Save Changes and Exit
This option passes control to the WINBIOS without writing any changes made to the CMOS RAM. Press <Enter> with this option highlighted to continue the boot process without saving any altered system parameters.

Continue
Press <Enter> with this option highlighted to return to the main menu of the Setup program.

Main Menu Setup Screen

Below is the Setup Main Menu:

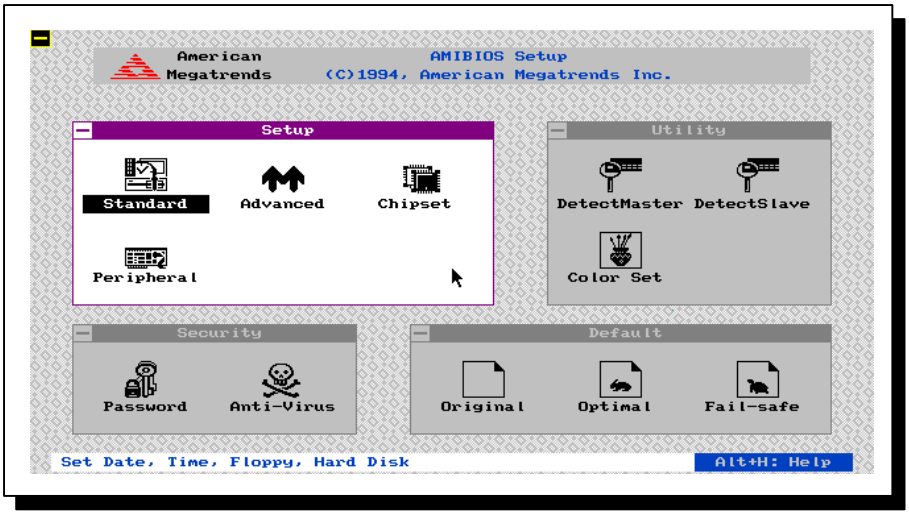


Figure 3. Main Setup Menu

The Main Setup Menu is divided into four windows each with several submenu options:

Setup Window
- Standard Setup
- Advanced Setup
- Chipset Setup
- Peripheral Setup

Utility Window
- Detect Master Hard Disk
- Detect Slave Hard Disk
- Color Set

Security Window
- Password
- Anti-Virus

Default Window
- Original Settings
- Optimal Settings
- Fail-safe Settings

Standard Setup

This menu permits the user to configure and set system components such as time and date, floppy drives, and hard disk drives. Use the arrow keys to highlight the icon labeled Standard, then press <Enter>. The following screen appears:

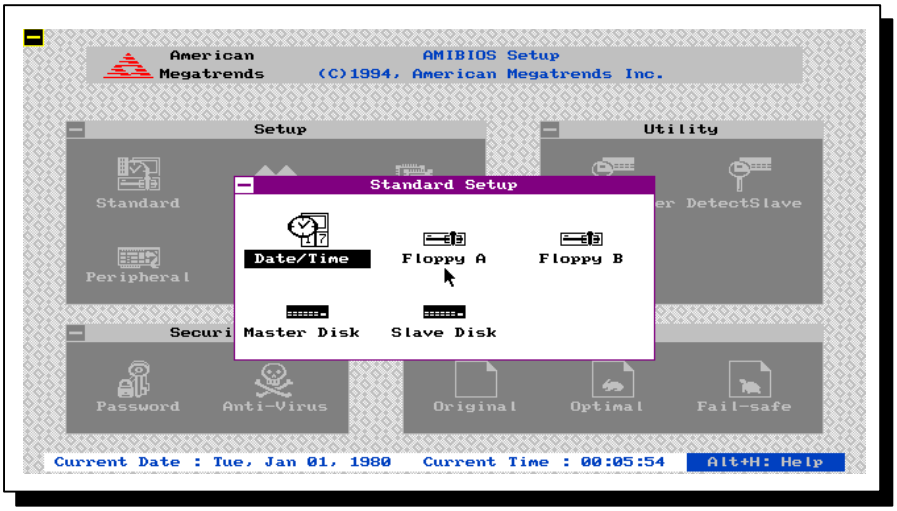
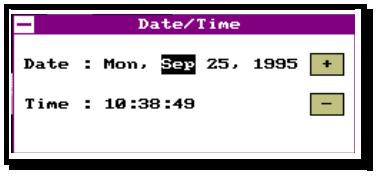


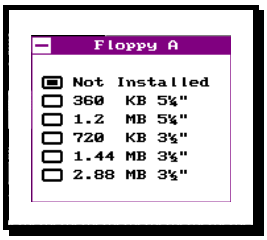
Figure 4. Standard Setup Menu

Date/Time

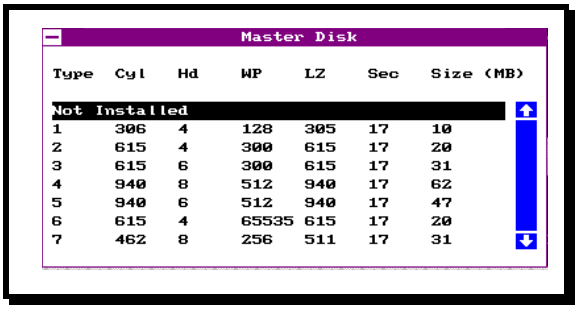
This option permits the month, day, year, hour, minute, and second stored in CMOS to be changed Press <Enter> to bring up the modification screen then move the cursor to the field you wish to change by using the arrow keys. Change the setting by using '+' and '-' keys or entering the value directly with the keyboard. The time uses a 24 hour clock format. For P.M. numbers, add 12 to the hour (4:30 P.M. is 16:30:00).



Floppy Drives A: and B:
The WINBIOS supports 720KB, 1.44MB, and 2.88MB 3.5 inch drives; 360KB, and 1.2MB 5.25 inch drives. Move the cursor to either field with the arrow keys and set the appropriate floppy drive type using the arrow keys then press <Enter>.



Master and Slave Hard Disks
Hard disk types from 1 to 46 are industry standard. The USER type is user-definable and can be used for both the master and slave drive. If the USER type is selected, the user must enter the proper hard drive parameters from the keyboard. The parameters for the USER type under the master hard disk and slave hard disk can be different, which allows two different user-definable hard disk drives in the system. **Not Installed** can be used for diskless workstations The two remaining settings are for ESDI and SCSI hard disks. The WINBIOS only supports manual drive parameter selection for hard drives connected to the primary IDE channel. Any hard drives connected to the secondary IDE channel will be auto detected during POST. The parameters used for these drives will be exactly the ones reported by the drive. The user is not allowed to override these settings.



Hard Disk Configuration

Hard disks are available with many different types of interfaces and controller options. The WINBIOS has built-in support for several of the most common interface standards: IDE/EIDE, SCSI, ESDI and ST-506/MFM. In general, depending on the controller used the WINBIOS needs to be configured to recognize the hard drives connected.

The most common type of hard disk today uses the IDE or EIDE interface. This type of drive is very simple to install and configure. The Nx586 system board supports up to four IDE/EIDE devices using a primary and a secondary IDE channel. Each channel supports up to two IDE/EIDE drives or other IDE/ATAPI devices such as CDROMs or Tape Backup devices.

Hard drives are identified by several parameters:

Parameter	Description
Type	The number designation for a drive with certain identification parameters.
Cyl - Cylinders	The number of cylinders in the disk drive.
Hd - Heads	The number of heads.
WP - Write Precompensation	The size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write precompensation circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number where write precompensation begins.
Lz - Landing Zone	This number is the cylinder location where the heads will normally park when the system is shut down.
Sec - Sectors	The number of sectors per track. Hard drives that use MFM have 17 sectors per track. RLL drives have 26 sectors per track. RLL and ESDI drives have 34 sectors per track. SCSI and IDE drives may have even more sectors per track.
Size	The formatted capacity of the drive based on the following formula: (Number of heads) x (Number of cylinders) x (number of sectors per cylinder) x (512 bytes per sector)

Table 3. Hard Drive Configurations

IDE/EIDE drives can be configured simply by using the DetectMaster and DetectSlave commands in the Utility Window. Older ST-506/MFM type hard drives require manual selection of these parameters. The WINBIOS provides a table with 46 of the most common parameters for these drives. Also a 47th entry can be used to enter any configuration not found in the table. Refer to your hard disks manual for the proper settings if you have this type of drive.

Type	Cyls.	Heads	Write Precomp	Landing Zone	Sectors	Capacity
1	306	4	128	305	17	10MB
2	615	4	300	615	17	20MB
3	615	6	300	615	17	31MB
4	940	8	512	940	17	62MB
5	940	6	512	940	17	47MB
6	615	4	65535	615	17	20MB
7	462	8	256	511	17	31MB
8	733	5	65535	733	17	30MB
9	900	15	65535	901	17	112MB
10	820	3	65535	820	17	20MB
11	855	5	65535	855	17	35MB
12	855	7	65535	855	17	50MB
13	306	8	128	319	17	20MB
14	733	7	65535	733	17	43MB
16	612	4	0	663	17	20MB
17	977	5	300	977	17	41MB
18	977	7	65535	977	17	57MB
19	1024	7	512	1023	17	60MB
20	733	5	300	732	17	30MB
21	733	7	300	732	17	43MB
22	733	5	300	733	17	30MB
23	306	4	0	336	17	10MB
24	925	7	0	925	17	54MB
25	925	9	65535	925	17	69MB
26	754	7	754	754	17	44MB
27	754	11	65535	754	17	69MB
28	699	7	256	699	17	41MB
29	823	10	65535	823	17	68MB
30	918	7	918	918	17	53MB
31	1024	11	65535	1024	17	94MB
32	1024	15	65535	1024	17	128MB
33	1024	5	1024	1024	17	43MB
34	612	2	128	612	17	10MB
35	1024	9	65535	1024	17	77MB
36	1024	8	512	1024	17	68MB
37	615	8	128	615	17	41MB
38	987	3	987	987	17	25MB
39	987	7	987	987	17	57MB
40	820	6	820	820	17	41MB
41	977	5	977	977	17	41MB
42	981	5	981	981	17	41MB
43	830	7	512	830	17	48MB
44	830	10	65535	830	17	69MB
45	917	15	65535	918	17	114MB
46	1224	15	65535	1223	17	152MB
47	USER	USER	USER	USER	USER	USER

Table 4. Standard Hard Drive Parameter Settings

Advanced Setup

This menu permits the user to configure and setsome of the more complex settings forsystem components such as floppy drive swapping,system caches, shadow RAM control interrupt mapping. Use the arrow keys to highlight the icon labeled Advanced, then press <Enter>. The following screen appears:

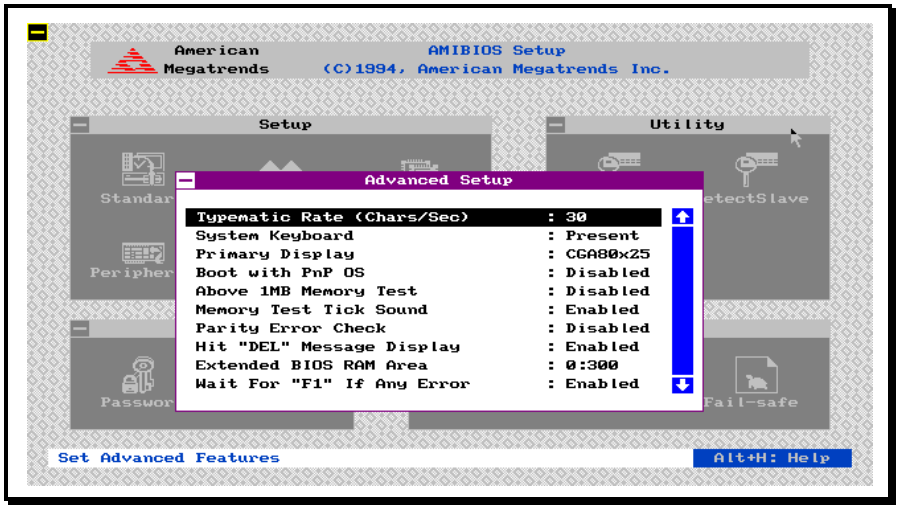

American Megatrends
AMIBIOS Setup
(C)1994, American Megatrends Inc.
Setup
Utility
Advanced Setup
Typematic Rate (Chars/Sec) : 30
System Keyboard : Present
Primary Display : CGA80x25
Boot with PnP OS : Disabled
Above 1MB Memory Test : Disabled
Memory Test Tick Sound : Enabled
Parity Error Check : Disabled
Hit "DEL" Message Display : Enabled
Extended BIOS RAM Area : 0:300
Wait For "F1" If Any Error : Enabled
Set Advanced Features
Alt+H: Help

Figure 5. Advanced Setup Menu, Page 1 of 5

Typematic Rate (Chars/Sec)
Typematic Rate sets the rate at which characters on the screen repeat when a key is pressed and held down. The settings are 15, 20, 24, or 30 characters per second.

System Keyboard
This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboards. The settings are Absent or Present.

Primary Display
Select this icon to configure the type of monitor attached to the computer. The settings are Monochrome, Color 40x25, Color 80x25, VGA/PGA/EGA, or Not Installed.

Boot with PnP OS
This option controls whether the BIOS or the OS gets to configure certain aspects of PnP compatible features. In general this option should be set to disabled which permits the BIOS to control the PnP features unless you are exclusively using a PnP compatible operating system..

Above 1 MB Memory Test
When this option is enabled, the WINBIOS memory test is performed on all system memory. When this option is disabled, the memory test is done only on the first 1 MB of system memory. The settings are Enabled or Disabled.

Memory Test Tick Sound
This option enables, (turns on) or disables, (turns off) the ticking sound during the memory test. The settings are Enabled or Disabled.

Parity Error Check
This option enables or disables parity error checking for system DRAM. The settings are Enabled, (all system DRAM parity is checked) or Disabled, (no parity is checked on any system DRAM). Parity checking should only be enabled when 36-bit SIMM modules are used. If 32-bit SIMMs are mixed with 36-bit SIMMs parity checking must be disabled.

Hit "DEL" Message Display
Disabling this option prevents the message:

Hit <DEL> if you want to run Setup

from appearing when the system boots. The settings are Enabled or Disabled.

Extended BIOS RAM Area
Specify in this option if the top 1 KB of the system programming area beginning at 639K or 0:300 in the system BIOS area in low memory will be used to store hard disk information. The settings are Top 1K or 0:300.

Wait for <F1> If Any Error
WINBIOS POST runs system diagnostic tests that can generate a message followed by:

Press <F1> to continue

If this option is enabled, WINBIOS waits for the end user to press <F1> before continuing. If this option is disabled, WINBIOS continues the boot process without waiting for <F1> to be pressed. The settings are Enabled or Disabled.

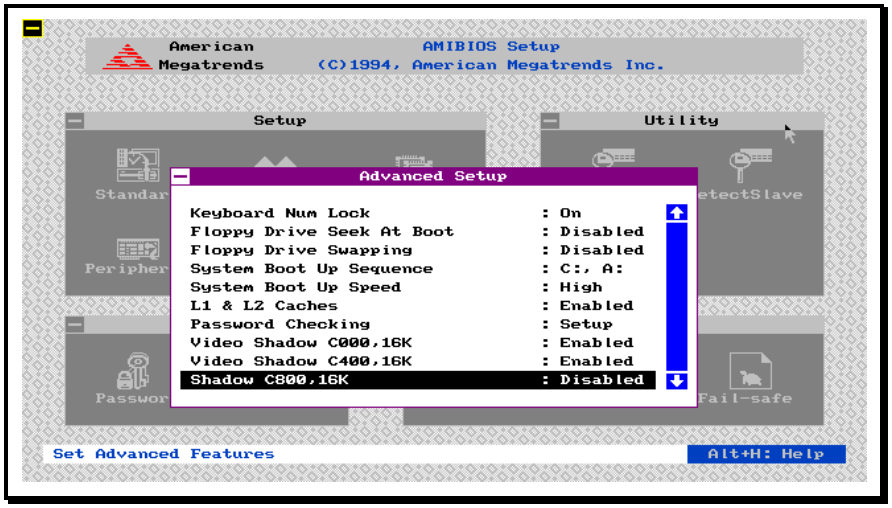


Figure 6. Advanced Setup Menu, Page 2 of 5

Keyboard Num Lock
When On, this option turns off Num Lock when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. The settings are On or Off.

Floppy Drive Seek At Boot
When this option is enabled, the WINBIOS performs a Seek command on floppy drive A: before booting the system. The settings are Enabled or Disabled.

Floppy Drive Swapping
When this option is enabled, the WINBIOS will swap the A: and B: floppy drives without the need to change any physical cabling or jumpers. This feature is handy when you have two drives of different types (i.e. 1.2MB and 1.44MB) and you need to boot at times from the drive installed as drive B:.

System Boot Up Sequence
This option sets the sequence of boot drives (either floppy drive A: or hard disk drive C:) that WINBIOS attempts to boot from after POST completes. The settings are C:,A: or A:,C:.

System Boot Up CPU Speed
This option sets the speed of the CPU at system boot time. The settings are High or Low.

L1 & L2 Caches
This option enables primary CPU and secondary cache memory. If Enabled is selected, the internal CPU cache and the external cache memory are enabled. If Disabled is chosen, all cache memory is disabled. The settings are Enabled or Disabled.

Password Checking
This option enables the password check option every time the system boots or the user runs Setup. The selections are Always or Setup. If Always is chosen, a user password prompt appears every time the computer is turned on. If Setup is chosen, the password prompt appears if WINBIOS setup is executed and a password has been entered previously. The Optimal and Fail-Safe default settings are Setup.

Video ROM Shadow C000,16K
Video ROM Shadow C400,16K
These options when set to Enabled, copy the video ROM area from C0000h - C7FFFh to shadow RAM for faster execution. The settings are Enabled or Disabled.

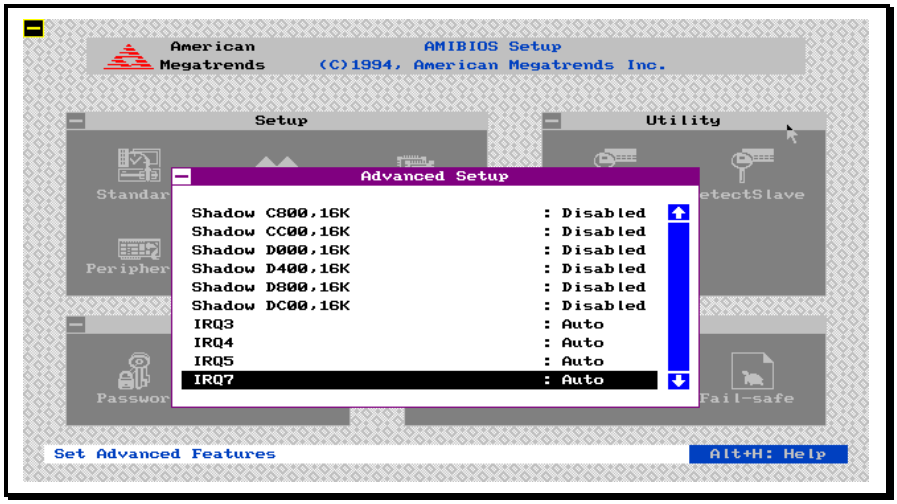


Figure 7. Advanced Setup Menu, Page 3 of 5

Shadow C800,16K
Shadow CC00,16K
Shadow D000,16K
Shadow D400,16K
Shadow D800,16K
Shadow DC00,16K
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enabled or Disabled. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

IRQ3
IRQ4
IRQ5
IRQ7
IRQ9
IRQ10
IRQ11
IRQ12
IRQ14
IRQ15
These options control whether the selected interrupt line is assigned to an ISA peripheral or left to be automatically assigned by the BIOS or PnP OS to either a PCI device or an ISA device. The selections are AUTO or ISA.

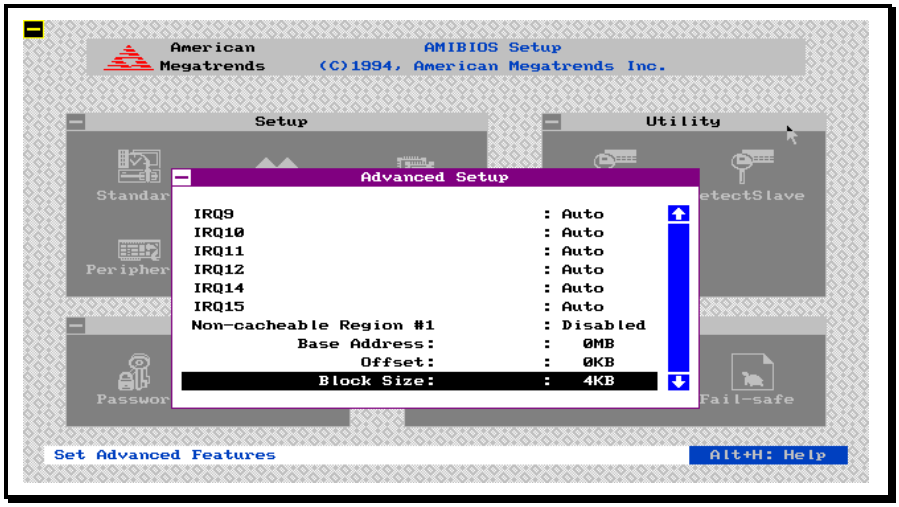


Figure 8. Advanced Setup Menu, Page 4 of 5

Non-cacheable Region #1
Non-cacheable Region #2
These options along with the Base address, Offset and Block Size options permit two areas of memory to be defined as non-cacheable. These options are useful for defining areas of memory which for some reason should not be cached by the processor. An example would be a memory mapped network card or other memory mapped peripheral.

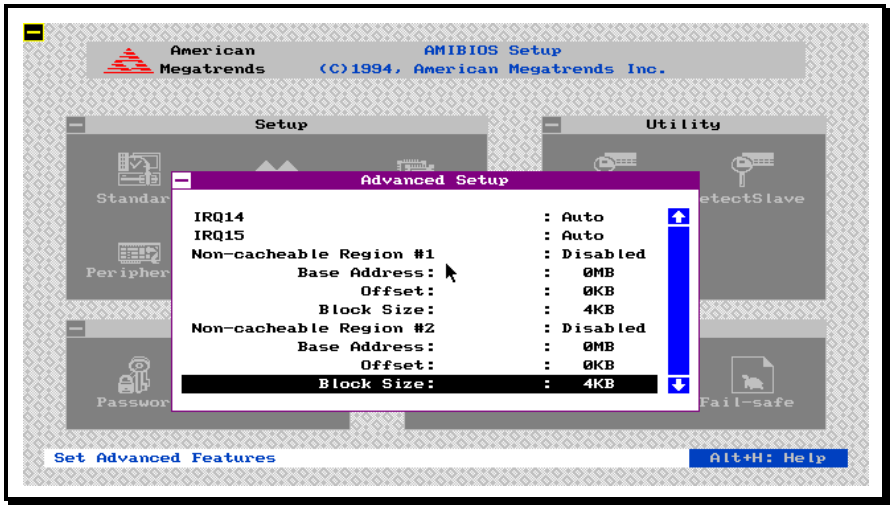


Figure 9. Advanced Setup Menu, Page 5 of 5

Chipset Setup

This menu configures chipset-specific features. ***These parameters have already been optimized for your system--improper use of this utility could result in system failure. Consult your dealer before attempting to use this option***. Several of the options in this section refer to NexBus clock periods (NxCLK or clk). This period is fixed at one half of the processor's clock speed. For example, a P100 processor operates at 93Mhz and a P90 processor operates at 84Mhz, therefore, the NxCLK periods would be 21.5ns for the P100 and 23.8ns for a P90 processor. The PCI bus in the asynchronous mode operates at 32Mhz for both processors. SCLK is the ISA bus clock witch is derived from the PCI bus clock. This information and detailed specifications on the other components installed, such as the DRAM, is necessary before making any adjustments to these settings.

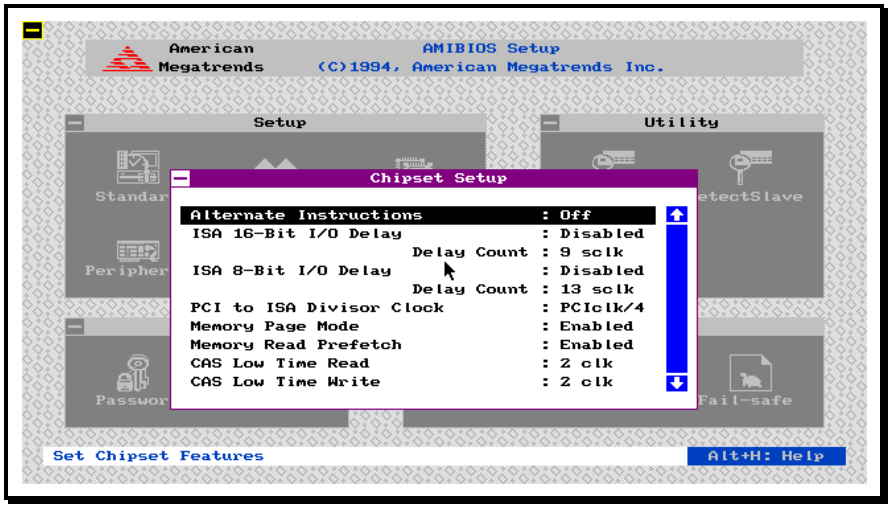


Figure 10. Chipset Setup Menu, Page 1 of 3

Alternate Instructions
This option should be set to OFF for normal operation. The settings are OFF or ON.

ISA 16-bit I/O Delay
Delay Count
This option controls the minimum number of ISA clock cycles (SCLK), permitted between back-to-back 16-bit I/O cycles to the ISA bus. When enabled the PCI to ISA bridge controller will guarantee that the minimum delay period defined in the 'Delay Count' field is present between 16-bit I/O cycles. When enabled the options are 6, 7, 8 or 9 SCLK periods.

ISA 8-bit I/O Delay
Delay Count
This option controls the minimum number of ISA clock cycles (SCLK), permitted between back-to-back 8-bit I/O cycles to the ISA bus. When enabled the PCI to ISA bridge controller will guarantee that the minimum delay period defined in the 'Delay Count' field is present between 8-bit I/O cycles. When enabled the options are 6, 7, 8, 9, 10, 11, 12 or 13 SCLK periods.

PCI to ISA Divisor Clock
This option controls the divisor used to generate the ISA bus CLK (SCLK), from the PCI bus clock, (PCICLK). The settings are divide by 3 or divide by 4. For example, a system with a 32Mhz PCICLK with a divide by 4 setting results in a ISA bus speed of 8MHz.

Memory Page Mode
This option enables or disables the DRAM controller's use of page mode timing. Page mode timing provides a performance improvement over non-page mode DRAM. Most DRAMs starting with the 1Mbit and later generation permit page mode operation. The default setting is enabled.

Memory Read Prefetch
The NxMC memory controller contains read prefetch buffers which minimize the latency involved in sequential reads from DRAM. When enabled, the NxMC attempts to have the next anticipated read data from the DRAM available to the processor in the zero wait state prefetch buffers. The settings are enabled and disabled.

CAS Low Time Read
This option controls the number of NxCLK periods that the CAS signal is low (active) during DRAM read cycles.

CAS Low Time Write
This option controls the number of NxCLK periods that the CAS signal is low (active) during DRAM write cycles. The settings are 1 or 2 NxCLK periods.

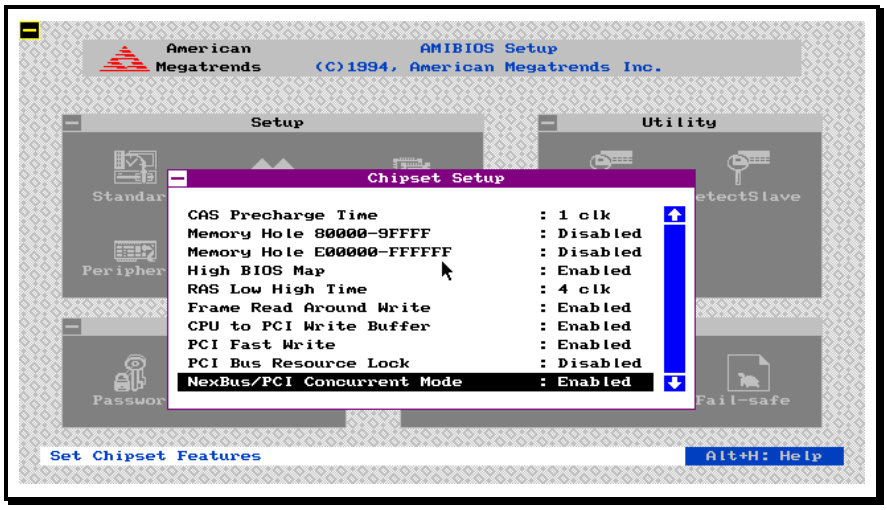

American Megatrends
AMIBIOS Setup
(C)1994, American Megatrends Inc.
Setup
Utility
Chipset Setup
CAS Precharge Time : 1 clk
Memory Hole 80000-9FFFF : Disabled
Memory Hole E00000-FFFFFF : Disabled
High BIOS Map : Enabled
RAS Low High Time : 4 clk
Frame Read Around Write : Enabled
CPU to PCI Write Buffer : Enabled
PCI Fast Write : Enabled
PCI Bus Resource Lock : Disabled
NexBus/PCI Concurrent Mode : Enabled
Set Chipset Features
Alt+H: Help

Figure 11. Chipset Setup Menu, Page 2 of 3

CAS Precharge Time
This option controls the minimum number of NxCLK periods that the CAS signal will be high (inactive) during required CAS precharge intervals. The settings are 1 or 2 NxCLK periods.

Memory Hole 80000-9FFFF
This option forces a hole in the DRAM memory space between 512K-640K. This feature would be used if you had a adapter card that could only be memory mapped in the lower 640K address space. Under normal operation this option should be set to disabled.

Memory Hole E00000-FFFFFF
This option forces a hole in the memory space between 14MB-16MB. Note that DOS will not size memory past any memory holes found in the DRAM space. Therefore if this feature were enabled and more than 16MB of DRAM were installed, only the first 14MB of DRAM would be useable to DOS and applications. UNIX operating systems do not have this limitation. This feature should be disabled under normal operation.

High BIOS Map
When enabled this feature permits the system BIOS to be visible at just below both the 1MB and the 4GB address boundaries. Setting this feature to disabled will prevent the BIOS from being visible at the 4GB address space. Under normal operation this feature should be left enabled.

RAS Low High Time
This option controls both the minimum RAS low (active) time and the RAS precharge time.

Frame Read Around Write
This option refers to the video frame buffer. The NxPCI controller contains both read and write buffers to the video frame area. This option when enabled allows read cycles to the video frame to bypass pending writes in the video frame write buffers.

CPU to PCI Write Buffer
The NxPCI controller provides a write buffer between the CPU and the PCI bus to improve system performance. This option controls the enabling and disabling of these write buffers.

PCI Fast Write
This option enables the use of 0WS write cycles to the PCI bus. The settings are Enabled or Disabled.

PCI Bus Resource Lock
When enabled this feature permits PCI Bus Masters to interrupt other Bus Masters if they are targeting another resource not currently in use. When disabled other Bus Masters are not permitted to interrupt locked cycles. This feature should be disabled under most situations.

NexBus/PCI Concurrent Mode
This option permits the NexBus and the PCI bus to operate independently whenever possible. When set to disabled an access on either bus ties up both buses.

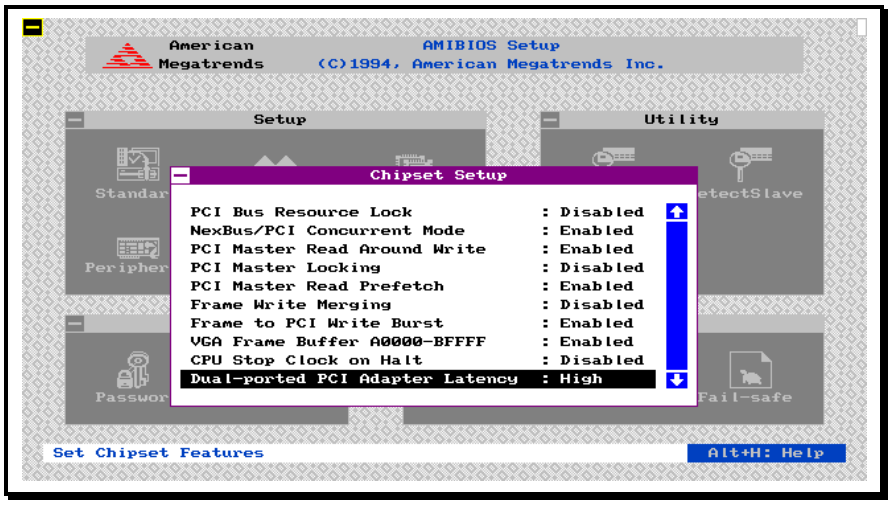

American Megatrends
AMIBIOS Setup
(C)1994, American Megatrends Inc.
Setup
Utility
Chipset Setup
PCI Bus Resource Lock : Disabled
NexBus/PCI Concurrent Mode : Enabled
PCI Master Read Around Write : Enabled
PCI Master Locking : Disabled
PCI Master Read Prefetch : Enabled
Frame Write Merging : Disabled
Frame to PCI Write Burst : Enabled
VGA Frame Buffer A0000-BFFFF : Enabled
CPU Stop Clock on Halt : Disabled
Dual-ported PCI Adapter Latency : High
Set Chipset Features
Alt+H: Help

Figure 12. Chipset Setup Menu, Page 3 of 3

PCI Master Read Around Write
When enabled this feature permits read requests, from PCI Masters to main memory, to bypass pending write requests in the PCI write buffers as long as the read request is not to one of the write target addresses.

PCI Master Locking
This option when enabled causes the NexBus to become locked during write access by a PCI Bus Master. In most cases this option should be disabled to permit the NexBus to operate independently from the PCI bus.

PCI Master Read Prefetch
Enables the NxPCI to use the prefetch buffers to read ahead data on the NexBus for PCI Bus masters.

Frame Write Merging
Enables byte/word/double word merging of writes to the video frame area. This option permits multiple 8-bit or 16-bit writes to be combined to a single 16 or 32-bit write by the NxPCI.

Frame to PCI Write Burst
Permits the gathering of multiple writes to the video frame area into a single PCI write burst cycle.

VGA Frame Buffer A0000-BFFFF
Enables the 128K address space from A0000-BFFFF as a prefetchable video frame buffer region.

CPU Stop Clock on Halt
When enabled the internal processor clock is stopped after the execution of a HALT instruction. This feature permits the processor to enter a low power state when idling, waiting for an event to occur.

Dual-ported PCI Adapter Latency
The settings are High or Low.

Peripheral Setup

This menu configures chipset-specific features. These parameters have already been optimized for your system--improper use of this utility could result in system failure. Consult your dealer before attempting to use this option.

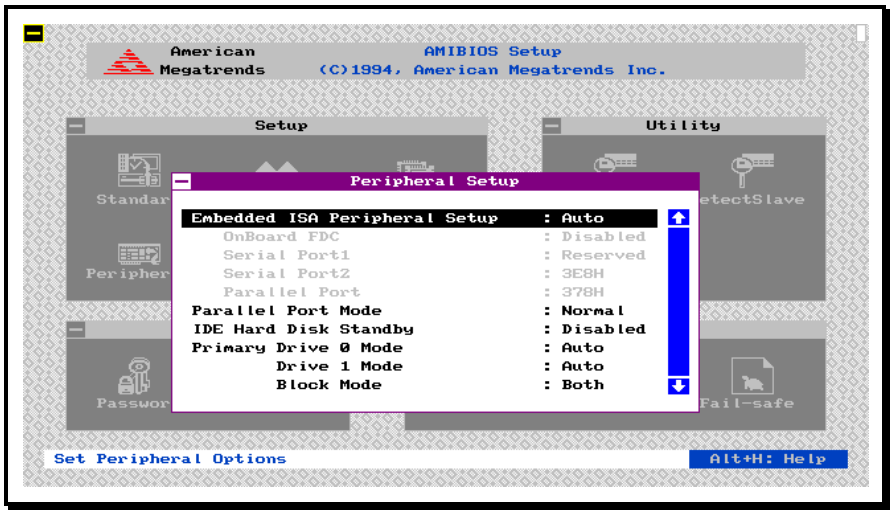


Figure 13. Peripheral Setup Menu, Page 1 of 3

Embedded ISA Peripheral Setup
This option controls whether the BIOS is allowed to automatically control the settings for the onboard peripherals (serial, parallel and floppy ports), or if the user manually controls their settings in setup. When set to Auto the BIOS will enable/disable or remap the onboard I/O devices to eliminate conflicts with I/O ports on adapter cards. The selections are Auto or Manual. When set to manual the following options can be controlled by the user:

Onboard FDC
This setting enables or disables the onboard floppy controller.

Serial Port1
Serial Port2
These options determine the base address for the two onboard serial ports. The selections are disabled, 03F8H (COM1), 02F8H (COM2), 03E8H (COM3), and 02E8H (COM4).

Parallel Port
This option controls the base address for the onboard parallel port. The options are disabled, 3BCH, 378H and 278H.

Parallel Port Mode
This options controls the functionality of the onboard parallel port. The options are Normal and Extended (ECP - Extended Capabilities Port) mode. This option should be set to match the capabilities of the device connected to the parallel port. The default setting is Normal mode.

IDE Hard Disk Standby
This option controls whether the IDE hard drives are told to spin-down after a selected time interval. When enabled, the IDE drives will be told to power down after a period of inactivity resulting in reduced system power consumption. When set to disabled, the IDE drives will never be told to power down. The selections are disabled, 20 seconds, 1 minute and 10 minutes.

Primary Drive 0 Mode

Primary Drive 1 Mode
These options control the transfer mode and rate between the selected IDE drive and the system. When set to Auto the BIOS will interrogate the drive upon boot up and select the optimum PIO transfer mode. Selecting any other option will force the drive into the particular mode selected. The DMA transfer modes can only be enabled by manually selecting them. Under some conditions the DMA mode will provide better performance, however, many IDE drives that purport to be compatible in truth are not. ***Warning, selecting a mode which is beyond the capabilities of your drive will result in system failure and potential data loss on the hard drive.***

Primary IDE 32 Bit Transfer
Secondary IDE 32 Bit Transfer
This option enables 32-bit data transfers on the IDE data port. If disabled, 16-bit data transfer is used by the WINBIOS. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

Primary IDE LBA Mode
Secondary IDE LBA Mode
Set this option to Enabled if using an IDE drive that supports LBA, (Logical Block Address) mode. IDE drives with a capacity greater than 528 MB support LBA mode. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

Primary IDE Block Mode
Secondary IDE Block Mode
This option enables multiple sector reads and writes for IDE drives. The settings are Enabled or Disabled. The Optimal and Power-On defaults are Enabled.

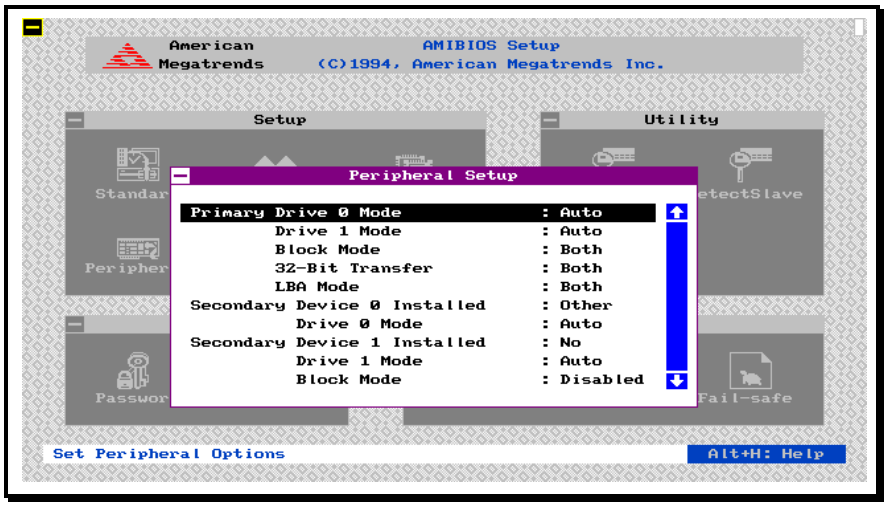


Figure 14. Peripheral Setup Menu, Page 2 of 3

Secondary Device 0 Installed
Secondary Device 1 Installed
These options determine whether there are any devices connected to the secondary IDE channel, device 0 is the Master and device 1 is the slave device. In general if you are installing an IDE CDROM or tape backup unit in general, it is best to connect these devices to the secondary IDE connector. The options are no (none), disk and other. Use the “disk” selection for a hard disk and “other” for any other type of device.

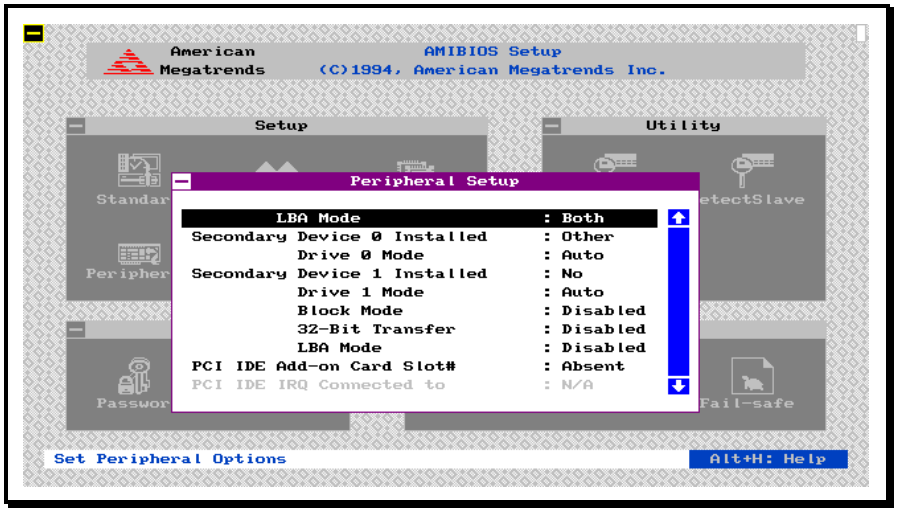
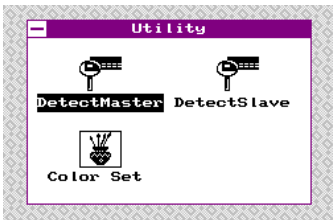


Figure 15. Peripheral Setup Menu, Page 3 of 3

PCI IDE Add-on Card Slot#
PCI IDE IRQ Connected to
These options control the setup of IDE adapters installed in the PCI slots. Normally the WINBIOS automatically detects and configures PCI IDE adapters. If a non-compliant PCI IDE adapter is installed and not recognized by the WINBIOS, use this option to enter the slot# and IRQ used by the adapter. In order for this type of adapter to function properly the BIOS needs to know if such an adapter is installed and which IRQ is used.

Utility Window

This window contains three options; DetectMaster, DetectSlave and Color Set. The DetectMaster option allows IDE/EIDE hard disks to be automatically detected configuring the proper number of heads, cylinders and sectors to make full use of the drive. The DetectSlave option performs the same operation for the slave or 2nd IDE hard disk installed in the system. The Color Set option allows you to control the color settings for optimal viewing on all type of displays.

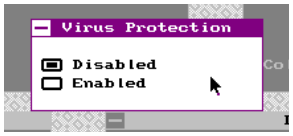


Security Window

This window contains two menus; Password and Anti-Virus. The Password menu allows you to set a password that will be required each time the system is turned on. If you forget your password, you will need to use the CLEAR CMOS jumper to erase the password. Doing this will also clear all of the other settings which you have made in any of the setup menus.

Boot Sector Virus Protection

When this option is enabled, WINBIOS issues a warning when any program or virus issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are Enabled or Disabled. If enabled, the following is displayed if any program attempts to write to the boot sector. You may have to type N several times to prevent the boot sector write.



Boot Sector Write!!!
Possible VIRUS: Continue (Y/N)? _

The following is displayed if any program attempts to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

Format!!!
Possible VIRUS: Continue (Y/N)?

Formatting the Hard Disk Drive

You should not enable anti-virus protection when formatting a hard disk drive.

The DOS hard disk Format utility does not use INT 13h function AH = 05h to format the hard disk. It only verifies the hard disk using the INT 13h Verify function, (AH = 04h). The virus warning message is not displayed during DOS hard disk drive formatting.

If the anti-virus feature is enabled, a virus warning message will be displayed when you attempt to format the hard disk drive.

If you select *Continue,* formatting proceeds as normal.

If you do not want to continue formatting, you may have to press N several times (depending on how many retries are performed by the upper-level software). DOS, for example, does at least five retries before the Format utility is actually aborted.

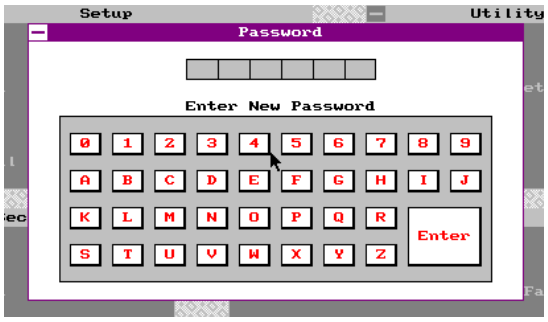
Password Support

WINBIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed. The following screen appears when you select the password icon.

You can enter a password by:

- typing the password on the keyboard,
- selecting each letter via the mouse, or

Setting a Password



The password check option is enabled in Advanced Setup, by choosing either *Always,* (the password prompt appears every time the system is powered on) or *Setup*, (the password prompt appears only when WINBIOS Setup is run). The password is stored in CMOS RAM. The system asks for a password.

Enter a 1 – 6 character password. The password does not appear on the screen when typed. WINBIOS will ask you to retype the password. Make sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system.

Changing a Password

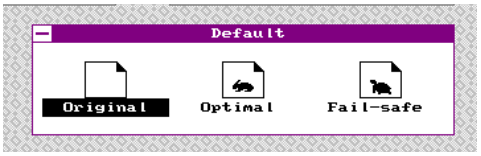
Select the *Password* icon from the Security section of the WINBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WINBIOS Setup Main Menu. The password is stored in CMOS RAM after WINBIOS Setup completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Remember the Password

Keep a record of the new password when the password is changed.

Default Window



This window contains three options; Original, Optimal and Fail-safe. These three options set all of the Advanced, Chipset and Peripheral settings to preprogrammed values by the factory. Under most conditions the optimal settings should be used to achieve the best overall system performance. If you experience any abnormal system behavior try using the Fail-safe settings. If you change your mind after selecting either the Optimal or Fail-safe settings before you save changes and exit, the Original menu can be used to restore and modified parameters to their original values when you entered Setup.

Original
Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.

Optimal
You can load the optimal default settings for the WINBIOS Setup options by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

Fail-Safe
You can load the Fail-Safe WINBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WINBIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

Factory Recommended CMOS Settings

The factory recommended settings are listed below. These settings should be used in the event CMOS RAM has been corrupted, or for some reason you wish to reset CMOS to the factory's recommended settings. However, if your hard disk does not have an operating system, change the setting at **System boot up sequence** to **A:,C:**. For Adapter ROM shadowing, enable shadow whenever appropriate (i.e.: adapter card has on-board BIOS).

CAUTION!
Users are not encouraged to change Advanced CMOS settings unless they are familiar withconfiguring system parameters. Improper use of these utilities can result in system failure.

Advanced CMOS Setup			
Typematic Rate (Chars/sec)	30	Shadow D400,16K	Disabled
System Keyboard	Present	Shadow D800,16K	Disabled
Primary Display	VGA/EGA	Shadow DC00,16K	Disabled
Boot with PnP OS	Disabled	IRQ3	Auto
Above 1M Memory Test	Disabled	IRQ4	Auto
Memory test tick sound	Enabled	IRQ5	Auto
Parity Error Check	Disabled	IRQ7	Auto
Hit <DEL> Message Display	Enabled	IRQ9	Auto
Extended BIOS RAM Area	0:300	IRQ10	Auto
Wait for <F1> if any error	Enabled	IRQ11	Auto
Keyboard Num Lock	On	IRQ12	Auto
Floppy Drive Seek at Boot	Enabled	IRQ14	Auto
Floppy Drive Swapping	Disabled	IRQ15	Auto
System Boot Up Sequence	A:, C:	Non-Cacheable Region #1	Disabled
System Boot Up	High	Starting Base Addr.	0MB
L1 & L2 Caches	Enabled	Offset	0MB
Password Checking	Setup	Block Size	4KB
Video Shadow C000,16K	Enabled	Non-Cacheable Region #2	Disabled
Video Shadow C400,16K	Enabled	Starting Base Addr.	0MB
Shadow C800,16K	Disabled	Offset	0MB
Shadow CC00,16K	Disabled	Block Size	4KB
Shadow D000,16K	Disabled		

Table 5. Advanced Setup Default Settings

Chipset Setup			
Alternate Instructions	Off	RAS Low High Time	4 clk
ISA 16-bit I/O Delay	Disabled	Frame Read Around Write	Enabled
Delay Count	9 sclk	CPU to PCI Write Buffer	Enabled
ISA 8-bit I/O Delay	Disabled	PCI Fast Write	Enabled
Delay Count	13 sclk	PCI Bus Resource Lock	Disabled
PCI to ISA Divisor Clock	PCIclk/4	NexBus/PCI Concurrent Mode	Enabled
Memory Page Mode	Enabled	PCI Master Read Around Write	Enabled
Memory Read Prefetch	Enabled	PCI Master Locking	Disabled
CAS Low Time Read	2 clk	PCI Master Read Prefetch	Enabled
CAS Low Time Write	2 clk	Frame Write Merging	Disabled
CAS Precharge Time	1 clk	Frame to PCI Write Burst	Enabled
Memory Hole 80000-9FFFF	Disabled	VGA Frame Buffer A0000-BFFFF	Enabled
Memory Hole E00000-FFFFFF	Disabled	CPU Stop Clock on Halt	Disabled
High BIOS Map	Enabled		

Table 6. Chipset Setup Default Settings

Peripheral Setup			
Embedded ISA Peripheral Setup	Auto	Primary IDE LBA Mode	Both
OnBoard FDC	Enabled	Secondary Device 0 Installed	No
Serial Port1	3F8H	Drive 0 Mode	N/A
Serial Port2	2F8H	Secondary Device 1 Installed	N/A
Parallel Port	378H	Drive 1 Mode	N/A
Parallel Port Mode	Normal	Block Mode	N/A
IDE Hard Disk Standby	Disabled	32-bit Transfer	N/A
Primary Drive 0 Mode	Auto	LBA Mode	N/A
Drive 1 Mode	Auto	PCI IDE Add-on Card Slot#	Absent
Block Mode	Both	PCI IDE IRQ Connected to	N/A
32-bit Transfer Mode	Both		

Table 7. Peripheral Setup Default Settings

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Technical Reference

Nx586 System Board Jumper Settings

Connectors

J18	Reset Switch
J17	Speaker connector
J16	Keylock/Power LED connector
J25	+12V Fan connector
JP15	Turbo LED connector
J10-J12	PCI bus slots
J14,J22-J24	16-bit ISA slots
P2	Power connector
P1	Keyboard connector

Extended Capabilities Parallel Port (ECP Mode) DMA Selection

JP01	JP18	
1-2	1-2	DMA REQ3/ACK3 for ECP Parallel Port
2-3	2-3	DMA REQ1/ACK1 for ECP Parallel Port (Default)

Onboard IDE

JP04	JP05	JP06	JP07	JP08	
IN	IN	2-3	X	1-2	Onboard IDE with Legacy IRQ(Default)
OUT	OUT	2-3	2-3	2-3	Onboard IDE with PCI INT
OUT	OUT	1-2	2-3	X	Onboard IDE disabled

x = don't care

Onboard Serial Port Interrupts - J07

1-2, 3-4	COM2 to IRQ3, COM1 to IRQ4(Default)
1-3, 2-4	COM1 to IRQ3, COM2 to IRQ4

PCI BUS Clock - JP12

IN	Async PCI Bus Clock (Default)
OUT	Sync PCI Bus Clock

CRT Type - JP02

IN	Color CRT
OUT	Mono CRT (Default)

Clear CMOS Memory - JP20

IN	Clear CMOS memory
OUT	Normal (Default)

JP14

1-2 Set at factory, do **not** change.

JP9, JP10, JP11

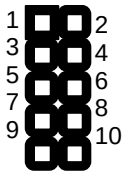
Set at factory, do **not** change.

Connector/Cable Diagrams

Serial Cable

IDC Header Pin Number	DB-25M Connector Pin Number	DB-9M Connector Pin Number	Signal Names
1	8	1	Data Carrier Detect
2	6	6	Data Set Ready
3	3	2	Rx Data
4	4	7	Ready To Send
5	2	3	Tx Data
6	5	8	Clear To Send
7	20	4	Data Terminal Ready
8	22	9	Ring Indicator
9	7	5	Ground
10	n/c	n/c	

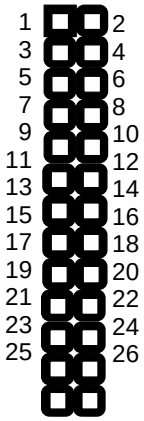
J04/J06



Parallel Cable

IDC Header Pin Number	DB-25M Connector Pin Number	Signal Names
1	1	STB-
2	14	AFD-
3	2	DATA<0>
4	15	ERROR-
5	3	DATA<1>
6	16	INIT-
7	4	DATA<2>
8	17	SLCTIN-
9	5	DATA<3>
10	18	GND
11	6	DATA<4>
12	19	GND
13	7	DATA<5>
14	20	GND
15	8	DATA<6>
16	21	GND
17	9	DATA<7>
18	22	GND
19	10	ACK-
20	23	GND
21	11	BUSY
22	24	GND
23	12	PE
24	25	GND
25	13	SLCT
26	n/a	NOT USED

P4



Technical Support

If you encounter any problems during the installation or operation of your system, please contact the dealer where you purchased the system. If they are unable to resolve the problem check one of NexGen's on-line support sites. NexGen maintains a BBS (Bulletin Board System), a Internet FTP site and a Internet World Wide Web site. These sites contain the latest driver and BIOS releases, and answers to commonly asked questions.

NexGen BBS System:

408.955.1839
14.4K bps
8 bits, 1 stop, no parity

NexGen Internet Web Site:

www.nexgen.com

NexGen Internet FTP Site:

ftp.nexgen.com

Notes

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